WHAT IS CLAIMED IS:

1.   A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface; and

a detector adapted to detect the induced fluorescence.

2.   The particle analyzer of claim 1, further comprising a substrate adapted to mount the sample collection surface.

3.   The particle analyzer of claim 2, wherein the sample collection surface is at least partially thermally isolated from the substrate.

4.   The particle analyzer of claim 3, further comprising temperature modifying means thermally coupled to the sample collection surface.

5.   The particle analyzer of claim 4, wherein the temperature modifying means comprises heating means.

6. The particle analyzer of claim 4, wherein the temperature modifying means comprises cooling means.

7. The particle analyzer of claim 1, wherein the particle concentrator is adapted to provide mass sorted particles to the sample collection surface.

8. The particle analyzer of claim 1, wherein the sample collection surface comprises an adsorbate.

9. The particle analyzer of claim 1, wherein the sample collection surface comprises carbon nanotubes.

10. The particle analyzer of claim 1, wherein the energy source provides energy that induces at least some excitation fluorescence in a material of interest.

11. The particle analyzer of claim 1, further comprising an energy source lens adapted to direct the energy from the energy source to at least a portion of sample collection surface.

12. The particle analyzer of claim 1, wherein the detector is adapted and configured to detect excitation fluorescence while being at least substantially blind to reflective energy from the energy source.

13.   The particle analyzer of claim 1, wherein the detector is adapted and configured to detect excitation fluorescence while being positioned at an angle relative to the sample collection surface such that reflective energy from the energy source does not impinge upon the detector.

14.   The particle analyzer of claim 1, further comprising a detection lens adapted to focus induced fluorescence on the detector.

15.   The particle analyzer of claim 1, wherein the detector is sensitive to a plurality of wavelengths.

16.   The particle analyzer of claim 1, wherein the detector comprises an array of pixels.

17.   The particle analyzer of claim 16, wherein at least some of the pixels of the array of pixels are sensitive to a plurality of wavelengths, and are configured to provide a spatially resolved image.

18.   The particle analyzer of claim 16, wherein at least some of the pixels of the array of pixels are sensitive to a single wavelength band.

19. The particle analyzer of claim 1, wherein the detector comprises a plurality of pixels sensitive to ultraviolet light and a plurality of pixels sensitive to visible light.

20. The particle analyzer of claim 19, wherein the plurality of pixels sensitive to ultraviolet light are arranged in a first linear array and the plurality of pixels sensitive to visible light are arranged in a second linear array.

21. The particle analyzer of claim 19, wherein at least some of the pixels sensitive to ultraviolet light and at least some of the pixels sensitive to visible light are positioned in an array in pair-wise fashion.

22. The particle analyzer of claim 1, further comprising a controller that is configured to control operation of the energy source and the detector.

23. The particle analyzer of claim 22, wherein the controller is further configured to control a temperature modifying means that is thermally coupled to the sample collection surface in accordance with a programmed or programmable temperature profile.

24. The particle analyzer of claim 1 further comprising a humidity controller for controlling the humidity level around the sample collection surface.

25. The particle analyzer of claim 1 further comprising a PH controller for controlling the PH level at the sample collection surface.

26. The particle analyzer of claim 1 further comprising a chemical controller for selectively adding one or more chemicals to the sample collection surface.

27. A particle analyzer device, comprising:

a substrate;

a sample collection surface disposed over the substrate; and

temperature adjusting means thermally coupled to the sample collection surface.

28. The particle analyzer device of claim 27, wherein the sample collection surface is at least partially thermally isolated from the substrate.

29. The particle analyzer device of claim 27, wherein the substrate includes a cavity, and the sample collection surface is at least partially suspended over the cavity.

30. The particle analyzer device of claim 29, further comprising a support member at least partially suspended over the cavity, where the sample collection surface is disposed on the support member.

31. The particle analyzer device of claim 30, wherein the support member comprises one or more legs connecting the support member to the substrate.

32. The particle analyzer device of claim 30, wherein the temperature adjusting means is disposed adjacent to or within the support member.

33. The particle analyzer device of claim 29, wherein the substrate comprises a silicone wafer.

34. The particle analyzer device of claim 27, wherein the temperature adjusting means comprises a resistive heater.

35. The particle analyzer device of claim 27, wherein the temperature adjusting means comprises a thermoelectric cooling element.

36. The particle analyzer device of claim 27, wherein the sample collection surface comprises an adsorbate.

37. The particle analyzer device of claim 27, wherein the sample collection surface comprises carbon nanotubes.

38. A method of detecting bioparticles, comprising the steps of:

distributing the bioparticles onto a surface;

directing energy towards the surface, the surface having a first temperature;

detecting at least some induced fluorescence from the particles present on the surface;

changing the surface to a second temperature that is different than the first temperature;

directing energy towards the surface; and

detecting at least some induced fluorescence from the particles present on the surface.

39.   The method of claim 38 further comprising the step of controlling the humidity around the surface.

40.   The method of claim 38, wherein distributing the bioparticles onto a surface further comprises collecting the bioparticles from within an aerosol.

41.   The method of claim 40, wherein the steps of directing an energy source towards the surface and detecting at least some resultant fluorescence are repeated a plurality of times in accordance with a temperature profile.

42.   The method of claim 41, wherein the temperature profile comprises a step-wise temperature profile.

43.   The method of claim 41, wherein the temperature profile comprises a continuously increasing temperature.

44.   The method of claim 41, wherein the temperature profile comprises temperature settings inputted by a user in response to detected fluorescence.

45.   The method of claim 38, further comprising a cleansing step in which the surface is heated to a temperature sufficient to burn off at least some particles present on the surface, thereby preparing the substrate for a new sample.

46.   A method of detecting bioparticles, comprising the steps of:

directing energy towards the bioparticles, the bioparticles having a first temperature;

detecting at least some induced fluorescence from the bioparticles;

changing the temperature of the bioparticles to a second temperature that is different than the first temperature;

directing energy towards the bioparticles; and

detecting at least some induced fluorescence from the bioparticles.

47.   The method of claim 46, wherein the detecting at least some induced fluorescence steps comprises detecting fluorescence over a plurality of wavelengths.

48.   The method of claim 46, wherein the detecting at least some induced fluorescence step comprises detecting fluorescence in a spatially resolved manner.

49.   The method of claim 46, wherein the steps of directing energy towards the bioparticles and detecting any resultant fluorescence are repeated a plurality of times in accordance with a temperature profile.

50.   The method of claim 49, wherein the temperature profile comprises a step-wise temperature profile.

51.   The method of claim 49, wherein the temperature profile comprises a continuously increasing temperature.

52.   The method of claim 49, wherein the temperature profile comprises temperature settings inputted by a user in response to detected fluorescence.

53.   The method of claim 46, further comprising a cleansing step in which the particles are heated to a temperature sufficient to reduce or eliminate the fluorescence from the particles.

54.   A method of detecting particles within a sample, comprising the steps of:
causing the sample to be at an initial temperature;
illuminating the sample; and
detecting at least some fluorescence.

55.   The method of claim 54, wherein detecting at least some fluorescence comprises detecting at least some fluorescence over a plurality of wavelengths.

56.   The method of claim 54, wherein detecting at least some fluorescence comprises detecting at least some fluorescence in a spatially resolved manner.

57.   The method of claim 54, further comprising subsequent steps of:

causing the sample to be at a revised temperature;

illuminating the sample; and

detecting at least some fluorescence.

58.   The method of claim 57, further comprising a cleansing step in which the sample is heated to a temperature sufficient to reduce or eliminate at least selected fluorescence from the sample.

59.   A method of detecting particles, comprising the steps of:

providing a sample;

illuminating the sample;

detecting at least some fluorescence;

heating the sample to reduce or eliminate at least selected fluorescence from the sample; and

providing another sample;

illuminating the sample; and

detecting at least some fluorescence.

60.   A method of detecting particles present within an aerosol, comprising steps of:

providing a sample;

directing energy towards a first portion of the sample;

detecting at least some induced fluorescence from the particles present within the first portion of the sample;

directing energy towards a second portion of the sample; and

detecting at least some induced fluorescence from the particles present within the second portion of the sample.

61.   The method of claim 60, further comprising subsequent steps of:

sequentially directing energy towards each of a plurality of sample portions; and

sequentially detecting at least some induced fluorescence from the particles present within each of a plurality of sample portions.

62.   The method of claim 61, wherein the steps of:

sequentially directing energy towards each of a plurality of sample portions; and

sequentially detecting at least some induced fluorescence from the particles present within each of a plurality of sample portions each occur at a first surface temperature.

63.	The method of claim 62, further comprising subsequent steps of:

heating the sample to a second temperature that is greater than the first

temperature;

sequentially directing energy towards each of the plurality of sample portions; and

sequentially detecting at least some induced fluorescence from the particles

present within each of the plurality of sample portions.